

REMARKS

The abstract and specification have been amended in order to correct grammatical and idiomatic errors contained therein. No new matter has been added.

The claims have been amended in order to correct grammatical and idiomatic errors contained therein. No substantive amendments have been made to the claims so no new matter has been added.

Claims 1-10 have been rejected under 35 USC 103(a) as being unpatentable over Takei et al in view of Kumagai et al. Claims 1-3 and 5-9 have been rejected under 35 USC 103(a) as being unpatentable over Takei et al in view of JP '094. Claims 1-3 and 5-9 have also been rejected under 35 USC 103(a) as being unpatentable over Takei et al in view of JP '093. Claims 1-9 have been rejected under 35 USC 103(a) as being unpatentable over Takei et al in view of JP '482. Claims 1-3 and 5-9 have been rejected under 35 USC 103(a) as being unpatentable over Takei et al in view of Tsuchida et al. Applicants respectfully traverse these grounds of rejection and urge reconsideration in light of the following comments.

The presently claimed invention is directed to a resin composition containing the following components as essential components, (A) a polyol, (B) a polyisocyanate and (C) a silane coupling agent containing an imidazole group. The ratio NCO/OH of the number of isocyanate groups in the polyisocyanate to the number of hydroxyl groups in the polyol is from 0.6-4.0 and the weight ratio of the polyol plus isocyanate to the silane coupling agent is from 100:0.1 to 100:10. The present invention is also directed to a urethane-based paint, a fluorine-based paint, a urethane-based adhesive, a urethane foam and an elastomer containing the inventive resin composition.

As discussed in the present specification, during the reaction of a polyol with a polyisocyanate, tertiary amine compounds and organo-metal compounds are conventionally used

as catalysts. Since the tertiary amine compounds have an especially good moldability and productivity, they are more commonly used. A side-effect with tertiary amine catalysts is that they generally have an unpleasant odor and are highly volatile. The present invention was arrived at in order to solve this problem of the unpleasant odor produced when a tertiary amine compound is used as the catalyst in a reaction between a polyol and a polyisocyanate and provides a resin composition that promotes the curing of these resins and improves their adhesion to metals, inorganic materials and organic materials. It is respectfully submitted that the prior art cited by the Examiner does not disclose the presently claimed invention.

The Takei et al reference has been cited as disclosing polyurethanes derived from a hydroxyl functional polymer and a polyfunctional isocyanate compound wherein the molar ratio NCO/OH is preferably in the range of from 0.8-1.2. As admitted by the Examiner, this reference does not disclose the provision of a silane coupling agent containing an imidazole group. The secondary Kumagai et al reference was cited by the Examiner as providing the motivation to use a silane coupling agent containing an imidazole group with the composition of Takei et al. Applicants respectfully disagree with the Examiner.

Kumagai et al discloses resin additives containing an imidazole/organic monocarboxylic acid salt derivative reaction product which is capable of improving the adhesion between a resin and a metal such as copper, steel or aluminum, or an inorganic material such as glass fiber, silica, aluminum oxide or aluminum hydroxide. The Examiner points to column 5, lines 59 and 65 of this reference which states that the resin additives may be used with polyurethane resins and fluororesins as showing that it will be obvious to use the additive of Kumagai with the polyol and polyisocyanate of Takai. Applicants respectfully disagree.

The Kumagai et al reference shows that the imidazole/organic monocarboxylic acid salt derivative reaction product of that reference can be used with a product polyurethane or fluororesin. There is no suggestion that any advantage would be gained by using this reaction product in the reaction of the components that make up the polyurethane resin. As shown in Figure 1 of the present application, imidazole silane A and imidazole silane B, which are both Examples of the present invention, when used as a resin additive, show almost the same curing ability as triethylamine catalysts and show a better result than the imidazole compound or the silane compound alone.

As discussed in the present specification, when a silane coupling agent containing an imidazole group of the present invention is used in the reaction between a polyol and a polyisocyanate, the odor involved with the use of a tertiary amine catalyst can be avoided and the reaction of a polyol with a polyisocyanate can provide a resin composition that has improved adhesion to metals, inorganic materials and organic materials. There is no suggestion in Kumagai et al that the addition of the reaction product disclosed there to the reaction components of a polyol and a polyisocyanate would be advantageous on the basis of the disclosure in this reference of the addition of the additive disclosed there to the reaction product of the polyol and polyisocyanate. Therefore, Applicants respectfully submit that the Examiner has not even made a showing of prima facie obviousness under 35 USC 103(a) with respect to the presently claimed invention and the unexpected benefit associated with the presently claimed invention is more than sufficient to rebut any proper showing of prima facie obviousness under 35 USC 103(a).

The remaining secondary references, JP '094, JP '093, JP '482 and Tsuchida et al all disclose the addition of a resin additive to a resin, like the previously discussed Kumagai et al reference, but do not show the addition of the resin additive to the components that make up the polyurethane

resin or suggest that any benefit would be gained thereby. In fact, there is no expectation that the reaction would even occur between the polyol and the polyisocyanate in the presence of a silane coupling agent containing an imidazole group based on the disclosures of the secondary references. Therefore, for the reasons advanced above, Applicants respectfully submit that the presently claimed invention is patentably distinguishable over any combination cited by the Examiner.

Reconsideration of the present application and the passing of it to issue is respectfully solicited.

Respectfully submitted,


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